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The effects of yoga, aqua yoga, aqua exercises on body composition responses

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Abstract

Due to recent advances in yoga research, technology, and facilities, many modes of yoga therapy now exist. These aqua yoga modes assist individuals in the performance of activities that may be too difficult to complete on land. However, the biomechanical requirements of each aqua yoga mode may elicit different body fat and BMI responses. Therefore, the purpose of this research was to: (a) provide a review of the body fat and BMI differences between yoga, aqua yoga and aquatic exercises, and (b) examine the acute effects of yoga in water, yoga in land and aquatic exercise on body fat and BMI for adult women. Methods consisted of the retrieval of experimental studies examining the body fat and BMI effects of Yoga in land (YL), Aqua Yoga (AY), and Aquatic exercise (AE). The methods also examined the body fat and BMI effects on 60 participants during and after three consecutive practice sessions on yoga in land, yoga in water and on exercises in water. Based on the studies reviewed, when compared to an aqua yoga, yoga and aqua exercises in training induced alterations on body mass index and percent body fat, but can be higher during yoga in water and yoga lower in aquatic exercises modes than on aqua yoga. The body fat and BMI are collected from the four groups prior to and post experimentation was analysed statistically to find practices on body fat was collected through pre and post-test scores and subjected to statistical treatment using ANCOVA. Table 1 shows the results obtained.

Keywords: Aqua yoga, aqua exercises, yoga in land

Introduction

Table 1 Analysis of Covariance on Percent Body Fat of Experimental and Control Groups

	Aqua Yoga	Yoga in Land	Aquatic Exercise	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre-test Mean SD	18.69	18.20	18.11	18.37	B	2.95	3	0.98	0.21
	1.81	2.09	2.24	2.30	W	252.22	56	4.50	
Post-test Mean SD	14.52	15.82	16.87	18.15	B	107.22	3	35.74	16.56*
	0.89	1.32	0.74	2.35	W	120.84	56	2.15	
Adjusted Post-test Mean	14.46	15.84	16.90	18.14	B	109.84	3	36.61	17.52*
					W	114.91	55	2.08	

* Significant at 0.05 level of confidence.

Table-1 shows that the pre-test mean and standard deviation on percent body fat of aqua yoga, yoga and aquatic exercise and control groups are $18.69 + 1.81$, $18.20 + 2.09$, $18.11 + 2.24$ and $18.37 + 2.30$ respectively. The obtained 'F' ratio value of 0.21 for pre-test means on percent body fat of aqua yoga, yoga and aquatic exercise and control groups were less than the required table value of 2.77 for the degrees of freedom 3 and 56 at 0.05 level of confidence. It reveals that there is statistically insignificant difference among the aqua yoga, yoga and aquatic exercise and control groups during pre-test period. It inferred that the random assignment of the subjects for the four groups is successful.

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The post-test mean and standard deviation on percent body fat of aqua yoga, yoga and aquatic exercise and control groups are $14.52 + 0.89$, $15.82 + 1.32$, $16.87 + 0.74$ and $18.15 + 2.35$ respectively. The obtained 'F' ratio value of 16.56 for post-test means on percent body fat of aqua yoga, yoga and aquatic exercise and control groups are greater than the required table value of 2.77 for the degrees of freedom 3 and 56 at 0.05 level of confidence.

The adjusted post-test means on percent body fat of aqua yoga, yoga and aquatic exercise and control groups are 14.46, 15.84, 16.90 and 18.14 respectively. The obtained 'F' ratio value of 17.52 on percent body fat were greater than the

required table value of 2.77 for the degrees of freedom 3 and 55 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted post-test means of experimental and control groups on percent body fat.

Results on Body Mass Index (BMI)

The data on the effect of Aqua Yoga, Yoga practices and Aquatic exercises practices on body mass index was collected through pre and post-test scores and subjected to statistical treatment using ANCOVA. Table 2 shows the results obtained.

Table 2: Analysis of Covariance on Body Mass Index of Experimental And Control Groups

	Aqua Yoga	Yoga in Land	xAquatic Exercise	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre-test Mean	27.22	27.38	26.98	27.08	B	1.33	3	0.44	0.16
SD	1.70	1.54	1.74	1.50	W	148.43	56	2.65	
Post-test Mean	22.71	24.03	25.19	27.18	B	161.87	3	53.95	28.51*
SD	0.80	1.28	1.36	1.84	W	105.97	56	1.89	
Adjusted Post-test Mean	22.69	23.96	25.25	27.21	B	166.95	3	55.65	33.78*
					W	90.59	55	1.64	

* Significant at 0.05 level of confidence.

Table-2 shows that the pre-test mean and standard deviation on body mass index of aqua yoga, yoga and aquatic exercise and control groups are $27.22 + 1.70$, $27.38 + 1.54$, $26.98 + 1.74$ and $27.08 + 1.50$ respectively. The obtained 'F' ratio value of 0.16 for pre-test means on body mass index of aqua yoga, yoga and aquatic exercise and control groups were less than the required table value of 2.77 for the degrees of freedom 3 and 56 at 0.05 level of confidence. It reveals that there is statistically insignificant difference among the aqua yoga, yoga and aquatic exercise and control groups during pre-test period. It inferred that the random assignment of the subjects for the four groups is successful.

The post-test mean and standard deviation on body mass index of aqua yoga, yoga and aquatic exercise and control groups are $22.71 + 0.80$, $24.03 + 1.28$, $25.19 + 1.36$ and $27.18 + 1.84$ respectively. The obtained 'F' ratio value of 28.51 for post-test means on body mass index of aqua yoga, yoga and aquatic exercise and control groups are greater than the required table value of 2.77 for the degrees of freedom 3 and 56 at 0.05 level of confidence.

The adjusted post-test means on body mass index of aqua yoga, yoga and aquatic exercise and control groups are 22.69, 23.96, 25.25 and 27.21 respectively. The obtained 'F' ratio value of 33.78 on body mass index were greater than the required table value of 2.77 for the degrees of freedom 3 and 55 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted post-test means of experimental and control groups on body mass index.

Discussion

The result of the present study indicates that effect of aqua yoga, yoga and aquatic exercise reduced the body composition variables such as body mass index and percent body fat. Our findings demonstrated that a 12-week, five days-weekly program leads to reduced body mass index, percent body fat, and quality of life in people with adult women. Furthermore, the benefits of yoga, aqua yoga and aquatic exercises appear to remain 12 weeks after the cessation of the supervised program. Despite statistically significant differences between groups, effect size

calculations revealed only small benefits of aqua yoga for reduced body mass index, percent body fat, and quality of life and doubtful clinical benefits for body composition. To our knowledge, no other research has compared exercise protocols performed at the same exercise training in three different settings (water versus land) on obese adult subjects. Only two studies compared different exercise modalities: an aquatic group with a walking group, and progressive resistance training with progressive aerobic aquatic training. A novel approach of this manuscript is based on the use of warm water as an exercise setting for healthy elderly. This choice results in agreement with the need for a higher water temperature for water exercise in older subjects with respect to their younger counterparts, as suggested by Barbosa *et al.*

Conclusion

The present study demonstrated that a 12-week program of aqua yoga, yoga in land and aquatic exercises training to alter on body mass index. Aqua yoga training is better than the yoga in land and aquatic exercises training to reduce on percent body fat. Between protocols, the aqua yoga appeared a better activity to increase dynamic balance and promote weight loss, although further data are needed to confirm these findings. Yoga in water swimming pools and the use of yoga practice as a method of asanas monitoring should be considered suitable tools to enhance physical fitness in healthy obese subjects.

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